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PS40.

Asymptomatic 50-75% Internal Carotid Artery Stenosis in 288 patients: Risk Factors for Disease Progression and Ipsilateral Neurological Symptoms

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Objectives: This study identified characteristics of patients with moderate internal carotid artery stenosis that are at increased risk for disease progression.

Methods: Patients with asymptomatic moderate internal carotid disease (peak systolic velocity [PSV] >125cm/sec and end diastolic velocity [EDV] <125cm/sec by duplex ultrasonography) correlating to 50-75% diameter reduction were followed for 3 years. Progression to greater than 75% diameter reduction (EDV > 125cm/sec) or presentation with focal neurological symptoms (stroke, amaurosis fugax, transient ischemic attack [TIA]) was documented. Co-morbidities, smoking status and medications were recorded. Log-rank testing, Wilcoxson models, and Kaplan-Meier plots provided statistical analysis.

Results: During 3 year follow up, 26 (9%) of 288 patients (137 men, 151 women) developed symptoms [stroke: 9 (3.1%), TIA: 3 (1%), amaurosis fugax: 3 (1%)] or asymptomatic increase in diameter to >75% [11 (3.8%)]. All-cause mortality was 11% (33 patients). 17 patients (5.9%) underwent carotid endarterectomy and 5 (1.7%) had carotid stent placement. The event incidence was significantly higher for men (P=.02), but survival was not different. The rate of disease progression and/or development of symptoms was 5.5% at 12 months and increased to 7.2% by 24 months. Co-morbidities with the highest associated event incidences were coronary artery disease [CAD] (8.1%), hyperlipidemia (7.3%), and hypertension [HTN] (6.7%). Medications associated with lower event incidences were insulin (2.8%) and angiotensin receptor blockers (1.9%).

Conclusions: 9% of patients with asymptomatic moderate carotid stenosis progressed to severe stenosis or developed ipsilateral neurological symptoms at three year follow-up. The rate of asymptomatic disease progression or symptom development was to 7.2% by 24 months. Male patients with CAD, hyperlipidemia, and HTN are at increased risk and are candidates for frequent screening and/or early intervention.

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PS42.

The Value of Near Infrared Spectroscopy and Transcranial Doppler to Predict the Onset of Cerebral Hyperperfusion Syndrome after Carotid Endarterectomy

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Objectives: Cerebral hyperperfusion syndrome (CHS) after carotid endarterectomy (CEA) is a potential life-threatening complication. Therefore, early identification and treatment of patients at risk is essential. CHS can be predicted by a doubling of post-operative transcranial Doppler (TCD) derived middle cerebral artery blood velocity (V) as compared to pre-operative values. However, in 15% of CEA patients an adequate TCD-signal cannot be obtained due to an insufficient temporal bone window. Near infrared spectroscopy (NIRS), estimating the frontal lobe oxygenation (rSO2) could be used as an alternative cerebral monitoring technique. We assessed the value of NIRS and peri-operative TCD to predict CHS after CEA.

Methods: In total, 151 consecutive patients undergoing CEA under general anesthesia having a sufficient TCD window were prospectively included. V and rSO2 measured before induction of anesthesia were compared to measurements in the first postoperative hour (ΔV, ΔrSO2 respectively). Logistic regression analysis was performed to determine the relationship between ΔV and ΔrSO2 and the occurrence of CHS. ROC curve analysis was used to determine the optimal cut-off values.

Results: Seven patients developed CHS. ΔV and ΔrSO2 differed between CHS and non-CHS patients (mean$\pm$SD), i.e. 63$\pm$29% vs 24$\pm$45% and 9$\pm$6% vs 1$\pm$9% respectively (P <.05). Increases in ΔV and ΔrSO2 were significantly associated with the occurrence of CHS, independent of age and gender, OR 1.47 (95% CI 1.04-2.09) per 30% increase in V and OR 1.77 (1.06-2.96) per 5% increase in rSO2. ROC curve analysis showed an AUC of 0.843 for ΔV and an optimal cut-off value of 62% increase (PPV 0.31, NPV 0.98). And an AUC of 0.793 for ΔrSO2 and an optimal cut-off value of 3% rSO2 increase (PPV 0.10, NPV 0.99).

Conclusions: Both TCD and NIRS seem to be useful to safely exclude patients from being at risk to develop CHS. However, due to the limited number of CHS cases our results need to be validated in a larger study.

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